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THE REVIEW

DEVOTED TO THE INTERESTS OF THE AMERICAN SOCIETY FOR METALS

Volume VIII | NOVEMBER, 1935 | No. 6

Bates Course Is Again Popular in Educational Work

At least 20 of the A.S.M. chapters are planning educational work this year. A wide variety of subjects and methods of presentation are offered, from classes on the fundamentals of metallurgy to such specialized subjects as corrosion, X-rays, and non-ferrous metals.

The course on "Fundamentals of Ferrous Metallurgy" prepared by Dr. A. Allen Bates of Case School of Applied Science and distributed from the National Office was so successful among the eight chapters who used it last year that many others are presenting it this fall. Two other such lecture courses are now available from the A.S.M. headquarters; they are James P. Gill's course on "Tool Steels" presented at the 1934 convention, and Dr. Marcus A. Grossmann's lectures on "Principles of Heat Treatment" which were given at the convention this year.

Montreal, Cincinnati, Golden Gate, and York Chapters are all planning to present the Bates course this fall. Cincinnati will also sponsor the metallurgical courses given at the University of Cincinnati evening school, and is arranging special discussion groups on subjects of current interest. Golden Gate will continue the past practice of sponsoring laboratory courses at Humboldt Evening High School.

New Haven Chapter has already started the series of lectures on tool steels by Gill, while the Rhode Island, Peoria, and Hartford Chapters are considering the presentation of one of these three courses.

The class to be held in Milwaukee will supplement in a more practical manner the Bates course presented there last year. Welding, testing, specifications, practical heat treating, and non-ferrous metals are the subjects.

Chicago's nine-lecture course will run until February and will cover non-ferrous subjects, manufacture of steel, metallography, and tool steel.

"The Corrosion of Metals" is the subject of the first section of Cleveland's educational work, for which 200 have already registered. At the completion of these five lectures three discussion conferences will be held, these to be followed by the spring course on principles and plant practice in heat treatment.

The first part of Detroit Chapter's educational program will be a series of lectures by Frederick G. Sefing on "The Story of Steel." "X-Rays in the Metallurgical Field" will be the subject of the second part.

Extensive in scope is New Jersey's series of ten weekly lectures on "Metal-

(Continued on page 5)

Aircraft Construction Uses More Al and Less Wood

Reported by George M. Enos

Cincinnati Chapter, Sept. 11—The speaker at the first regular meeting of the season was J. B. Johnson, chief of the Material Branch, Wright Field, Dayton. Mr. Johnson's talk dealt with recent developments in aeronautical materials.

He discussed the trends developed in the past five years in materials used in airplanes. It was interesting to note the increasing use of light aluminum alloys and the decrease in wood as a material of construction. Mr. Johnson spoke briefly on many developments, such as the new types of wing construction, special heat treatments of both ferrous and non-ferrous metals, and the testing of materials at sub-zero temperature.

Prizes to Be Awarded for Best Pictures!

Heat Treating Takes to the Camera in Novel Contest Now Being Sponsored by the American Society for Metals

Amateur photographers!

Dust off your cameras and polish up your furnaces. Then take a picture of your favorite heat treating operation.

Follow carefully the rules shown below and you may win a prize in the A.S.M.'s first National Amateur Photographic Contest. Prizes total $25.00, as follows:

First prize $10.00
Second prize 5.00
Two prizes of...2.50 each
Five prizes of...1.00 each

The prize-winning photograph will also be reproduced in one of the Society's publications.

A competent committee of judges will be appointed. Photographs will be judged on a basis of clarity of the operation photographed, quality of the photograph, and originality or novelty of the process selected.

The contest closes Feb. 1, 1936, and is open to both members and non-members of the Society. Contestants may submit as many entries as desired. Rules of the contest and some suggestions are given below.

RULES OF NATIONAL A.S.M. PHOTOGRAPHIC CONTEST

1. All photographs must show clearly the actual heat treating operation.
2. The steel and heat treatment must be described in a supplementary note.
3. No retouched photographs will be considered.
4. Enlargements or reductions of photographs may be entered. Glossy prints, not less than 3 by 5 in. in size are desired.
5. Entries must be mailed to National Photographic Contest, American Society for Metals, 7016 Euclid Ave., Cleveland, Ohio, not later than Feb. 1, 1936.
6. The American Society for Metals reserves the right to use any of the photographs submitted in any of its publications, proper printed acknowledgment being given to the photographer.

SUGGESTIONS TO PHOTOGRAPHERS

1. Wherever possible the pieces being treated should appear in the photograph.
2. It is also desirable to include the operator of the equipment, both for increasing the interest of the picture and for comparing the size of the apparatus.
3. A complete description should accompany the picture and should include the name of the part being treated, the kind of metal, the treatment, and the final physical characteristics. For instance, the picture might show a passenger car rear axle of S.A.E. 3140 steel being quenched at 1525° F. in oil. The tempering temperature should be given, and the hardness, tensile strength, toughness or other distinguishing properties of the finished part.
4. Correct exposure for the interior of a hot furnace is sometimes difficult to judge. The following table may be used as a guide.

	No filter		Filter K 2	
Temperature	f 3.5	f 7.7	f 3.5	f 7.7
1400° F.	½ sec.	2 sec.	1 sec.	4 sec.
1700° F.	¼ sec.	1 sec.	½ sec.	2 sec.

Character of Base Metal Reflected in Electroplate

Southern Tier Chapter, Oct. 21—Jenkins Inn, Waverly, N. Y., was the scene of this dinner meeting attended by 89 members and guests.

The speaker for the evening was George B. Hogaboom, research consultant for the Hanson-Van Winkle-Munning Co., one of the largest manufacturers of electroplating equipment in the United States. Mr. Hogaboom has spent his entire life in the plating industry and is one of the foremost authorities in this field. He was the first president of the American Electroplaters' Society, of which he is now an honorary member.

Mr. Hogaboom's subject was "What Is Under the Plate?" After a brief history of electroplating, he showed how too little attention has been paid to this aspect. Lantern slides clearly demonstrated that the character of the base metal is entirely reflected in the plate. Often the actual grain structure of the underlying metal is faithfully reproduced in the plate. In one slide it was impossible to tell where the base metal left off and the plate began. Mr. Hogaboom pointed out that controlling the grain size in the metal to be plated produces the desired result. Another condition pointed out was the existence of oxide films on the base metal which cause the plate to peel from the metal when subjected to aging.

The speaker's finest point was that closer cooperation between platers and metallurgists today is insuring a better product at less cost.

Address Changes

In sending address changes to the National Office, it will simplify the work of the membership secretary if members will include the chapter affiliation and old address along with the new.

Symposium on Welding Is Presented by Local Men

Reported by G. A. Ellinger

Washington Chapter, Oct. 21—For this meeting the Speakers Committee, headed by Bob Nation, decided to utilize local talent and acquaint the membership with some of our own gifted speakers. The meeting took the form of a Welding Symposium with three local members directly concerned with welding problems in the Navy Department as the speakers. They were Leon C. Bibber, senior welding engineer, Bureau of Construction and Repair, Hugo W. Hiemke, welding engineer, Bureau of Engineering, and Carl M. Underwood, welding engineer, Washington Navy Yard.

Mr. Bibber discussed the fundamental properties of weld metal and the effect upon them of many variables including composition of base metal; composition, type and size of electrodes; heat of arc; method of deposition; and temperature of the metal upon which the weld is deposited.

Mr. Hiemke discussed the effect of welding on the properties of base metal. The penetration of heat into the base metal causes changes in structure which range from unaffected base metal to melted areas at the junction of parent and weld metals. Many steels, particularly of the air hardening class, were formerly thought to be unweldable, but by proper technique and control, can now be welded satisfactorily.

Mr. Underwood discussed practical applications in the welding of steel castings. Large, expensive castings containing defects, which are revealed by X-ray inspection, may be repaired by welding and saved for service.

The meeting was thrown open to discussion by Chairman Rosenberg and the type and amount of discussion revealed the interest of the chapter in welding problems.

'Biggest and Best' Say Thousands About Convention

"Biggest and best in years" was the general enthusiastic verdict of the multitude who attended the National Metal Congress and Exposition held Sept. 30 to Oct. 4 in Chicago.

The exposition, with 230 colorful and instructive exhibits, drew a record attendance of well over 35,000. Technical sessions were crowded with scientists and engineers eager to learn and discuss the latest developments in the field of metals.

Dr. Grossmann's series of five lectures on heat treatment averaged an attendance of 230 members; Dr. Martin's three-lecture course on spectrographic analysis was heard by about 160. Sessions of the other cooperating societies were equally well attended and equally interesting.

At the annual meeting of the American Society for Metals held Wednesday morning, Oct. 2, Robert S. Archer was elected president, Edgar C. Bain vice-president, William P. Woodside treasurer, and Reid L. Kenyon and Sam C. Spalding new trustees.

Reports of the president, secretary and treasurer were read at the meeting and will be printed in full in December *Transactions*. The President's Bell for outstanding activities was awarded to the Chicago Chapter.

The business meeting finished, H. W. McQuaid presented the Campbell Memorial Lecture. (An extended abstract was printed in the November issue of *Metal Progress*, which also contains a more detailed report of Convention activities. The lecture will also be printed in full in December *Transactions*.)

W. A. Irvin, president of United States Steel Corp., was principal speaker at the Society's banquet held Thursday, Oct. 3. His discourse reviewed the latest technical developments in the steel industry and indicated the ever-widening field of applications for steel.

Other features of the banquet were the award of the Albert Sauveur Achievement Medal for outstanding contributions to metallurgy to Dr. Zay Jeffries, consulting metallurgist for Aluminum Co. of America and General Electric Co., Cleveland; the Henry Marion Howe Medal for the best *Transactions* paper during the past year to T. D. Yensen and N. A. Ziegler; and the Past-President's Medal to W. H. Phillips, president in 1933-34.

Plant inspection trips, held daily except Monday, included visits to Acme Steel Co., Inland Steel Co., Stewart Die Casting Corp., Museum of Science and Industry, International Harvester Co., Illinois Steel Co., Borg and Beck Co., and Lindberg Steel Treating Co.

Even the ladies were not forgotten in this momentous week. Luncheons, sightseeing trips, and visits to Chicago points of interest kept them busily entertained.

Methods for Carburizing at Caterpillar Tractor Co. Cited

Reported by Edwin F. Bicknell

Tri-City Chapter, Oct. 22—Eighty-nine members of the Chapter heard an address by G. C. Riegel, chief metallurgist of the Caterpillar Tractor Co. and vice-chairman of the Peoria Chapter.

Mr. Riegel's subject of "Carburizing and Cyaniding" was illustrated by citations of methods and processes used by the Caterpillar Tractor Co. The carburizer used at the Caterpillar plant for pack carburizing contains peach pits that are shipped in by carload lots from a California cannery.

THE REVIEW

Devoted to the interests of the American Society for Metals

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RAY T. BAYLESS.....*Editor*
M. R. HYSLOP.....*Managing Editor*

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Gleanings From the Chapters

How to open the season with a bang was shown by the Philadelphia Chapter, whose September meeting was the biggest in its history. Although they have 400 members, there were 600 registered at the meeting. That means 200 prospective members! . . . Other chapters are showing the same enthusiasm. Our Pittsburgh correspondent writes in, with complete confidence, that his chapter expects to add 100 names and reach the 700 mark this year. . . Chicago will have to look to its laurels as largest chapter (717 members—approximately 10% of the Society's total membership).

. . . . *And then along came New Jersey the other day with 72 new members, all at one swoop! We wonder if the temptingly interesting ten-lecture educational course that started Oct. 18 might not have something to do with it.* . . .

Chicago and Cleveland had the largest number of new members in the month of October. Chicago had 50, Cleveland 49, Tri-City 24, Pittsburgh 19, Los Angeles 13, Detroit 11, etc. . . . It is now necessary to print 8000 copies of *Metal Progress* to supply our members and subscribers.

Incidentally, Chicago is very proud of having wrested the President's Bell (awarded at the annual convention to the chapter whose activities for the year have been outstanding) away from the Cleveland Chapter, who managed to hang onto it for two years. . . . Speaking of the Convention, every chapter and group of the Society was represented in the attendance at the Grossmann lecture course. . . . Rochester Chapter sent 25 members to the convention, and that is pretty good from a total membership of 91.

Discussion periods at meetings are assuming such proportions that some of the chapters have found it necessary to inaugurate a regular question and answer service. . . . . In Los Angeles, questions asked during the meeting are jotted down in shorthand and turned over to a Consulting Board of six members. The findings of these men are tabulated and the majority answer is read at the next meeting. . . . . North West has a "Question Box" to which members may send, prior to the meeting, written questions they would like answered by the speaker. . . . . We even find extra meetings devoted entirely to discussion. Cincinnati's first discussion group will consider industrial furnaces, and other groups will be organized as soon as interest in a particular subject develops.

Cincinnati ran into a little trouble early in the fall when Norman Paquin, newly elected vice-chairman, very inconsiderately left town. However, a new election was held and the matter soon straightened out by advancing N. C. Strohmenger, who has served long and faithfully as secretary-treasurer, to the vacated post and electing Kurt Siems to take Nick's place. . . . . The resignation of Henry W. Grubb, as treasurer of the Notre Dame Group, resulted in the temporary appointment of George J. Foss to that office.

New Jersey inaugurates a new feature this year by serving refreshments at the close of the meeting. In other words, if you want to eat, you have to stick with the speaker. . . . . The meeting place of the North West Chapter has been changed to the Minnesota Union, on the campus of the University of Minnesota, midway between Minneapolis and St. Paul.

Baltimore Chapter snared a good sustaining membership—Black and Decker Mfg. Co. of Towson, Md. Theo. R. Koons is the representative. . . . . Arthur W. Stolzenburg was the lucky winner of the free dinner awarded by a drawing of advance reservations at the Cleveland Chapter's October meeting. . . . Frank Jeffries (Chicago Chapter) has not missed a chapter meeting in ten years. This is quite an enviable record, and we wonder if there are any other members who can equal or better it.

A somewhat cryptic note from our York correspondent states that as a result of the October meeting in Waynesboro Bill Allen announces that he will continue to play golf. To quote the correspondent: "The G-men say Bill found a number of the small round objects essential to the game when playing the Country Club course. Perhaps Jimmy Morrison can confirm." . . . Four chapters—Indianapolis, Tri-City, Rockford, and Peoria—sent teams to Chicago's Sixth Annual Golf Tournament, which was won by the home team. Besides all the individual golf prizes that were awarded, which are too numerous to list, ten consolation prizes were drawn, and a souvenir pencil given to all those who didn't win.

It is interesting to note that chairmen and past chairmen of seven different chapters are represented in the columns of personal notes in this issue. It just goes to show that the alert and progressive men in industry are the leaders in A. S. M. affairs.

The three southern Ohio Chapters, Columbus, Dayton, and Cincinnati, who have the same speakers on successive nights, are now calling themselves the Tri-Chapters, and are sending in a joint report of their meetings (a very fine example of which is Mr. Epstein's splendid report in the next column). The three committees have a habit of getting together and planning similar programs—thus they obtain high caliber speakers at low expense to the individual chapter.

. . . . *But the biggest chapter news of all is the number and variety of educational courses being offered this year. All sorts of new ideas and subjects are rampant, as will be seen from the information on page 1. And even that list is not yet complete!*

Blum Discusses Electroplates at 3 Ohio Meetings

Reported by S. Epstein

Tri-Chapters, Oct. 14, 15, 16—(The Columbus, Dayton, and Cincinnati Chapters have collaborated in the arrangement of their programs and will hear the same speakers on successive nights. They have therefore arranged to send in only one monthly report to cover all three meetings.—Ed.)

"The Protective Value of Electroplating on Metal" was the topic of the October meetings of the Tri-Chapter group each addressed by Dr. William Blum of the National Bureau of Standards. With the authority of many years' experience and recently obtained data, the speaker presented the essence of the subject in clear, simple style.

The results of three-year atmospheric corrosion tests of nickel and chromium coatings on steel in industrial, marine, and rural atmospheres were strikingly brought out by passing around actual test samples.

The protective value of "noble" coatings like nickel and chromium depends primarily on the thickness. A coating less than 0.001 in. thick gives poor protection; with 0.002-in. coatings there is practically no rusting. Chromium gives better resistance to tarnish than nickel, but no better corrosion resistance. Generally, therefore, a nickel coat is put on first to prevent corrosion, and is followed by a chromium coating for tarnish resistance. An astonishingly thin coating of chromium, say 0.00002 in., gives such protection.

The two main "base" metal coatings, which corrode preferentially to the steel and thus protect it even around pinholes, are zinc and cadmium. Zinc and cadmium coatings last for years in marine atmospheres, because the corrosion products are insoluble. In industrial atmospheres containing SO_2, however, corrosion is rapid.

No accelerated corrosion tests are very reliable or universally applicable, but the salt spray and ferroxyl tests have some merit if properly interpreted. The ingenious and simple "chord" method for testing the thickness of coating was illustrated, which consists in effect of taper grinding to greatly magnify the thickness.

Lively discussions followed the meet-

(Continued on page 3)

December *Transactions* Will Feature Annual Convention

The December issue of *Transactions* will feature the annual convention of the American Society for Metals.

It will present a report of the annual meeting of the Society which will bring members up-to-date on the status of their Society.

It will reproduce in full the Edward De Mille Campbell Memorial Lecture presented by H. W. McQuaid—"Aluminum Additions in Modern Commercial Steels."

The following papers and discussions will also be presented:

Chromium Steels of High Nitrogen Content, by Russell Franks.
Correlation of Failures from Embrittlement of 4 to 6% Chromium Steel with the Notched Bar Impact Test, by H. M. Wilten.
Factors Influencing the Nature of Cutting Speed-Tool Life Curves, by O. W. Boston, W. W. Gilbert and C. E. Kraus.
Physical Properties of Metals as Affected by Ammonia Synthesis, by H. L. Maxwell.
Influence of Carbon Content on the High Temperature Properties of Steels, by A. E. White, C. L. Clark, and R. L. Wilson.
A New Heat Resistant Alloy, by S. L. Hoyt and M. A. Scheil.
The Aging of Steel, by E. S. Davenport and E. C. Bain.
Hardening Characteristics of One Per Cent Carbon Tool Steels, by T. G. Digges and Louis Jordan.
Interpretation of Torsion Impact Properties of Carbon Tool Steel, by G. V. Luerssen and O. V. Greene.
Contributory Effects of Furnace Atmospheres on the Grain-Size of Molybdenum High Speed Steel, by Arthur Phillips and M. J. Weldon.

Other papers will also appear.

If you attended the Convention you will want to review these lectures. If you did not attend, be on the look-out for this important number.

Odds *and* Ends

Bottle Boycott

"Canned beer or none" is many a steel man's slogan today. With final decision in the big bottle-vs.-can battle of a century resting with the public, the steel fraternity can do its part by remembering—"when you say 'Prosit,' say it with canned beer!"

Lament

One prominent ASM member believes the can companies missed the chance of a lifetime to win the hearts of the stein-hoisters.

"Milk comes in pint containers, so does oil, liquor and a hundred other liquids—why not beer? Simply because twelve-ounce bottles have been used in the past, why saddle a twelve-ounce can on the beer-consuming public when what it craves is sixteen ounces—good for two real glasses of beer!"

Remember December!

Treasurer W. P. Woodside steps forth in December *Metal Progress* with a good story on the discovery of the double treatment of gears. The Editor gives you a report on the International Acetylene Convention held in Cleveland Nov. 12 to 15. Looks like another banner issue.

Are You Regular?

If not, drink coffee—and be sure it's Javol coffee. It's—believe it or not—mildly laxative! Anyway, whether you like cathartic coffee or not, it comes in cans.

Enter Aluminum

Just when tin is sitting pretty and looking forward to the 1936 production of a billion and a half cans for beer alone (this seems to be a can column), some one discovers a method of applying a non-corrosive coating of aluminum to steel. Since aluminum is cheaper than tin, it looks like the latter has something to worry about.

Up, Up, Up!

Advertising in the November issue of *Metal Progress* increased 51% over the same month a year ago. One reason for this increase is better business generally. Another is that advertisers are realizing more and more that the ASM market is the richest in the metal industries.

Chicago Notes

ASM members at the technical sessions had "nothing but the best" when it came to meeting rooms. Morning sessions were held in the ballroom of The Palmer House and in the afternoon at the exclusive Saddle and Sirloin Club at the Stockyards.

* * *

Most of the newspaper men attending the sessions went around with pained and puzzled expressions—99 44/100ths of the talk was over their heads (and mine too).

* * *

Perhaps it is significant of A.S.M. members that over 70% of those who registered the information at Dr. Grossmann's lecture course on heat treating fundamentals were college graduates. And of those, 23% had done post-graduate work!

* * *

The exhibits were the most striking ever presented at an industrial show. That's a big statement—but true. Sales managers, advertising and display men and decorators outdid themselves in this Metal Exposition.

* * *

And the Exposition was not only good to look at, it was *complete*. Everything from the metal itself to the equipment and machinery used to fabricate and finish it was on display.

Medals

We still receive mail addressed to the "American Society for Steel Treating" but the cocked hat goes to the writer who called it the "American Society for Medals"!

A. P. F.

Cleveland, Pitt Join In Inspection Trip

Reported by Gordon T. Williams

Cleveland-Pittsburgh Chapters, Oct. 17—The first joint meeting of the Pittsburgh and Cleveland Chapters was held at a neutral spot, Youngstown, Ohio. With members all over town, visiting plants and attending the evening session, Youngstown must have felt as neutral as the middle of a tug-of-war rope. Be that as it may, a goodly crowd had a fine time.

Three plant visits were arranged, and large numbers took advantage of the opportunities to see the continuous wide strip mill, melting, and tube departments at Youngstown Sheet and Tube Co.; the electric welding pipe mill and Bessemer plant of Republic Steel Corporation; and the Steckel Mill of Cold Metal Process Co. These mills, not all usually open for inspection, proved very interesting and instructive. The brave souls who visited all three plants became, successively, strip-conscious, tube-conscious, and foot-conscious. Your reporter suggests rickshaws for such occasions as this.

After the plant trips, the members gathered at the Ohio Hotel, special groups having private seminars on the social aspects of quenching, with particular reference to thirst. At 5:45, with only moderate difficulty, 200 were assembled for dinner in the ballroom. At the speakers' table sat a distinguished set of our betters, including a representative of the companies whose plants had been open to us; the Winchell of the A.S.M., Bill Eisenman; Past-President Phillips; Cleveland's inimitable (Allah be praised) Bates; Cleveland Chairman Pulsifer, and Vice-Chairman Croft; Pittsburgh's Jerome Strauss; Canton-Massillon's Buechling; and, most important, the technical speaker, our National President, Bob Archer of Republic.

Harry Pulsifer introduced the aforesaid notables, thanking the plants for the opportunity of visitation. National Secretary Eisenman told several stories. Jerome Strauss, acting as technical chairman, introduced the speaker.

Mr. Archer presented a fine summary of "Metallurgical Developments" with special regard to steel-making practice and fabrication. He illustrated his talk by many examples from personal experience, and broadly surveyed improvements and changes in practice and theory in the last few years.

Discussion was abbreviated to permit early adjournment, so that Pittsburghers and Clevelanders could unfold their man-miles homeward.

Heat Treating Fundamentals Explained in Simple Terms

Reported by J. N. Ostrofsky

Baltimore Chapter, Oct. 14—At the first fall meeting the Chapter was fortunate in securing W. J. Diederichs, metallurgist of the Autocar Co., Ardmore, Pa., as its speaker. His talk on "Fundamentals of Heat Treatment" was so well received two years ago at a meeting of the Society of Automotive Engineers that he was persuaded to repeat it for the Chapter.

In every-day terms Mr. Diederichs cleared away much of the mystery surrounding steels and their reaction to heat treatment. Starting with a brief discussion of the fundamental concepts of matter, he led up to the iron-carbon diagram by carefully chosen analogy and then discussed the heat treatment of steels on this basis.

Photographs Illustrate Aluminum Castings & Forgings of All Sizes

Reported by Edwin F. Bicknell

Tri-City Chapter, Oct. 14—Dr. Kent R. Van Horn of the Aluminum Co. of America addressed 75 members of the Chapter on aluminum castings and forgings.

His talk was illustrated with photographs taken in the Aluminum Co. plant. The pictures showed parts ranging in size from small motorcycle castings and forgings to castings made for diesel engines weighing between 5000 and 6000 lbs.

Proper Operation of Flame Cutting Effects Economies

Reported by B. R. Queneau

Northwest Chapter, Oct. 7—A special entertainment by Irving Cohen, who imitated those well-known artists Amos and Andy, started the October meeting. The members were startled by the plan with which this pair intended to make a fortune in the steel treating business.

The technical talk was given by J. J. Crowe, engineer in charge of apparatus research and development of the Air Reduction Sales Co. Mr. Crowe discussed "Flame Cutting and Other Uses of the Oxy-Acetylene Flame."

Emphasis was placed on economies to be realized by the selection of proper pressures, tips and speeds, and the importance of having oxygen of at least 99.5% purity. Precautions in cutting steel with higher than 0.30% carbon were given. A review of recent developments covered flame machining, billet gouging and deseaming, and flame hardening, which is being used quite extensively today on large gears.

Korp Relates Experience In Commercial Hardening

Reported by Elton W. Jenkins

New Jersey Chapter, Sept. 9—The first regular meeting was called to order by Chairman Elshoff who introduced each member of the Executive Committee to the body.

The speaker of the evening was Jordan Korp of the Leeds & Northrup Co., Philadelphia, who spoke on "Hardening Room Practices." His lecture was demonstrated by sketches and slides, and covered many of his actual experiences in commercial hardening rooms. They proved to be decidedly interesting as well as educational.

The Committee finished the meeting in great style by serving refreshments, a new feature initiated with the intention of creating a regular get-together session.

Competition of Metals On Merit and Value Is Subject Given by Dix

Reported by Gordon T. Williams

Cleveland Chapter, Oct. 7—Another big year started in Cleveland with 85 members and guests for dinner, and 100 later arrivals at the lecture.

Chairman Harry B. Pulsifer rang the bell to call the meeting to order. (You see, we had the President's Bell for two years, and our chairmen are old bell-ringers from way back, so Erle Ross gave us what we might call the Precedent Bell, in order that musical talent might not be stultified.) He then called on the blushing and stammering secretary for an account of his activities at the Chicago Convention just concluded. The secretary, realizing that he was on the spot again, omitted all the private and intimate details, but gave a strictly factual report of the sessions, meetings, lectures, and exhibits for the delectation of those unable to be in Chicago.

Programmer Bates discussed the events planned for the year, and Educator Churchill announced the lecture series (see page 1 for details). The Chairman congratulated Vice-Chairman Croft on the fine roster he and his committee have presented. Membership standings were mentioned in words which should cause fear and trembling in Pittsburgh and Chicago, where the chapters, probably with mirrors, appear to be leading Cleveland.

E. H. Dix, Jr., gave the technical address on "Competition Among Metals." The speaker's fine background of experience and achievement gave him the data for a splendid talk, discussing the real competition on merit and value between metals, particularly aluminum and steel. He touched on many of the instances in which aluminum had influenced other metal industries through rivalry.

E. E. Thum, editor of *Metal Progress*, serving as technical chairman, offered similar examples from his own experience, helping to make this an instructive and pleasant evening.

Chapter Programs; Secretaries' Addresses

BALTIMORE—Paul S. Lane, American Hammered Piston Ring Co.
Nov. 25—
Dec. 30—

BOSTON—H. E. Handy, Saco-Lowell Shops, Biddeford, Me.
Dec. 6—Tool Steels.....S. C. Spalding
Jan. 3—Static and Dynamic Tests.H. C. Mann

BUFFALO—B. L. McCarthy, Wickwire-Spencer Steel Co.
Dec. 12—Ni-Resist .....J. S. Vanick

CHICAGO—K. H. Hobbie, Driver-Harris Co., 1140 Washington Blvd.
Dec. 12—Cast Iron and Its Heat Treatment .....H. Bornstein
Jan. 9—Metallurgical Development.R. S. Archer

CINCINNATI—Kurt Siems, Cincinnati Milling Machine Co.
Dec. 11—Spring Materials and Design.... .....F. P. Zimmerle
Jan. 15—Light Alloys.....G. D. Welty

CLEVELAND—Gordon T. Williams, Cleveland Tractor Co.
Dec. 2—Fatigue .....J. R. Townsend
Jan. 6—Steel Castings.....F. A. Melmoth

COLUMBUS—L. H. Marshall, 2525 N. High St.
Dec. 9—Spring Materials and Design..... .....F. P. Zimmerle
Jan. 13—Light Alloys.....G. D. Welty

DAYTON—Fred M. Reiter, Dayton Power & Light Co.
Dec. 10—Spring Materials and Design.... .....F. P. Zimmerle
Jan. 14—Light Alloys.....G. D. Welty

DETROIT—E. B. Drake, 4841 Cass Ave.
Dec. 9—Joint Social Meeting
Jan. 13—Plain Bearings.....H. C. Mougey

GOLDEN GATE—R. S. Hirst, 2142 Ward St., Berkeley, Calif.

HARTFORD—H. J. Noble, Pratt & Whitney Aircraft Co.
Dec. 10—Fatigue Cracks Shown by Magnaflux Test.....A. V. deForest
Jan. 14—Molybdenum High Speed Steels.. .....Frank Garratt

INDIANAPOLIS—R. A. Thompson, Electric Steel Castings Co.
Nov. 26—Low Alloy Steels.....A. B. Kinzel
Dec. 16—X-Rays .....

LEHIGH VALLEY—L. H. Scheifele, Reading Co., Reading, Pa.
Dec. 6—Metallography .....V. O. Homerberg
Jan. 3—Mining for Music.....Sigmund Spaeth

LOS ANGELES—S. R. Kimberly, Los Angeles Steel Casting Co., 2444 S. Alameda Ave.
Nov. 18—Corrosion Resisting Tubing.... .....F. N. Speller
Dec. —Pyrometers .....
Jan. —Sucker Rods in Oil Wells.....

MILWAUKEE—W. J. Sparling, Chain Belt Co.

MONTREAL—B. W. Brownrigg, P.O. Box 371, Station H

MUNCIE—L. W. Murray, Delco-Remy Div., Anderson, Ind.

NEW HAVEN—J. F. Sargent, R. Wallace & Sons Mfg. Co., Wallingford, Conn.
Nov. 21—Stainless Steels.....R. P. DeVries
Dec. 19—Carburizing.....J. F. Wyzalek
Jan. 23—Copper Alloys.....D. K. Crampton

NEW JERSEY—J. H. Johnson, Jos. T. Ryerson & Sons Co.
Dec. 9—Sheet Steel.....Joseph Winlock
Jan. 13—Stainless Steel.....

NEW YORK—T. N. Holden, 1219 Glenwood Rd., Brooklyn
Nov. 18—Grain Size Here and in Europe .....E. C. Bain
Dec. —Stainless Steel in the Chemical Industry.....H. L. Maxwell
Jan. —Tools for Testing....J. R. Townsend

NORTH WEST—Alexis Caswell, Manufacturers' Association of Minneapolis, 405 Marquette Ave.
Nov. 22—Low Alloy Steels.....A. B. Kinzel
Dec. 10—National Officers' Night
Jan. 14—Forgings.....P. A. Birchfield

NOTRE DAME—Walter C. Troy, 9 Corby Hall, University of Notre Dame

ONTARIO—L. F. Fitzpatrick, 349 Carlaw Ave., Toronto
Dec. 6—Non-Ferrous Alloys....J. R. Freeman
Jan. 10—Welding .....David Boyd

PENN STATE—D. F. McFarland, Pennsylvania State College, State College, Pa.

PEORIA—J. W. Bridwell, Caterpillar Tractor Co.
Dec. 9—Heat Treatment of Alloy Steels .....M. A. Grossmann
Jan. 13—Corrosion Resisting Steels..... .....P. B. Greenawald

PHILADELPHIA—A. O. Schaefer, The Midvale Co.
Nov. 22—High Speed Steels .....
Dec. 6—Annual Social Evening
Jan. 3—Tool Steels.....M. W. Dalrymple
Jan. 10—.....N. L. Mochel
Jan. 31—Sheet and Strip Steels.....

PITTSBURGH—H. L. Walker, Box 6621
Dec. 12—
Jan. 9—Structural Stainless Steels..... .....W. B. Arness

RHODE ISLAND—C. G. Peterson, Providence Gas Co.

ROCHESTER—I. C. Matthews, Eastman Kodak Co.
Dec. 9—Tool Steels.....J. P. Gill
Jan. 20—Welding.....T. H. Nelson

ROCKFORD—Alan Mattison, Mattison Machine Works

SCHENECTADY—Lyall Zickrick, General Electric Co., Research Laboratory
Nov. 19—Dendritic Segregation .....
.....V. N. Krivobok
Dec. 17—Bearings .....C. Claus
Jan. 21—Competition Among Metals..... .....E. H. Dix, Jr.

ST. LOUIS—G. J. Moeller, Ramsey Accessories Mfg. Corp.
Dec. 20—Tool Steels.....J. P. Gill

SOUTHERN TIER—K. J. Mackenzie, International Business Machines Corp., Engineering Laboratory, Endicott, N. Y.

SPRINGFIELD—A. W. Morris, 54 Buckingham St.
Nov. 18—Super High Speed Steel....J. P. Gill
Dec. 16—Design and Heat Treating..... .....O. V. Greene
Jan. 20—Protection of Metals from Corrosion.....R. M. Burns

SYRACUSE—R. K. Warren, Crucible Steel Co.
Dec. 10—Fatigue of Steel.....G. R. Brophy
Jan. 14—Corrosion of Metals.....R. M. Burns

TRI-CITY—R. H. Lind, Peoples Light Co., Davenport, Iowa
Dec. 10—Modern Furnaces .....
Jan. —Mid-Year Stag Party

WASHINGTON—E. F. Wilson, Naval Gun Factory

WORCESTER—G. A. Peterson, Pratt & Inman

YORK—C. M. Strickler, General Machine Works, Lamour and Prospect Sts.
Dec. 4—Tool Steel.....A. L. Collins
Jan. 15—Aluminum Alloys .....

Three Ohio Chapters Hear About Protection by Plating

(Continued from page 2)

ings. In Columbus the question of wear resistance of chromium plate arose. Dr. Blum mentioned the use of chromium-plated gages, tools for cutting bakelite, hard rubber, etc.; chromium plating has not been successful on tools for cutting steel. An interesting use of chromium plating for its abrasion resistance is on the engraved printing plates for United States paper money.

In reply to a question as to the relative merits of cadmium and zinc coatings, Dr. Blum said that this has become almost an academic matter, since the price of cadmium has skyrocketed from about 60¢ to $1.00 a pound because of its use in bearings. Bright zinc coatings have been developed, but cadmium can be plated faster and more cheaply than zinc.

In the discussion at Dayton, the question was raised as to the merits of cadmium or zinc and nickel as a base for chromium plate as compared with copper and nickel. Dr. Blum stated that experimental panels in which cadmium or zinc were used under chromium failed very rapidly and were much inferior to nickel, or copper and nickel as a base.

It was asked how galvanized coatings compare with plated zinc coatings as to corrosion resistance. Dr. Blum stated that zinc coatings of equal thickness have equal corrosion resistance regardless of the method of deposition.

In a discussion of hydrogen embrittlement due to plating, Dr. Blum stated that hydrogen may pass through steel in a plating operation. He described experiments in which a sealed steel tube was made the cathode in an acid bath and hydrogen was detected on the inside of the tube. Some hydrogen remains in the steel and causes embrittlement, but may be removed by heating the steel, preferably in boiling water.

Trend Is Toward Quality With Economy — French

Reported by A. C. Forsyth

Northwest Chapter, Sept. 13—The Chapter was fortunate in being able to have H. J. French as speaker for the first meeting of the year. Mr. French is in charge of alloy steel and iron development for International Nickel Co.

Mr. French emphasized three main branches of the subject of alloy steels and irons: wrought steel, steel castings and stainless steel.

The recent industrial trend has been toward quality with economy. The speaker pointed out that better shop control, better design and a more comprehensive understanding of the effect of alloy additions has led to higher mechanical properties, thus requiring lower factors of safety and giving quality with economy.

These good mechanical properties are especially advantageous in parts requiring high fatigue resistance. Mr. French used the Zephyr as an illustration of the recent change in design and the use of ferrous alloys containing large percentages of alloying elements.

HERE AND THERE WITH OUR MEMBERS

B. D. Saklatwalla

In 1908 there arrived in New York a young Persian engineer, B. D. SAKLATWALLA, born in Bombay, India, educated at Charlottenburg Institute of Technology in Germany. In 1910 he became research chemist and metallurgist for the newly formed American Vanadium Co., and a year later was general superintendent. He developed a process for extracting vanadium from the ore and furthered its commercial application in the steel industry. He was made vice-president of the firm, now the Vanadium Corp. of America, in 1924.

Now in 1935 Dr. Saklatwalla is resigning from the Vanadium Corp. to form his own consulting engineering organization in Pittsburgh, which will be devoted mainly to the development of new steels and alloys and will have connections in foreign countries. Dr. Saklatwalla has been a member of the Pittsburgh Chapter since 1919.

* * *

On Sept. 30, just before his 80th birthday, DR. JOHN S. UNGER resigned as manager of the Research Bureau of Carnegie Steel Co. Although his first job was as an apprentice carpenter in Tarentum, Pa., he has served Carnegie Steel almost continuously since his graduation from Western University of Pennsylvania (now University of Pittsburgh) in 1887 as an analytical chemist. He was in succession assistant chemist at the Edgar Thomson Works, chief chemist at the Homestead Works, assistant superintendent and superintendent of the Armor Department, assistant general superintendent of the Homestead Works, and in 1908 became manager of the Central Research Bureau.

In addition to being a member of the Pittsburgh Chapter, A.S.M., since 1921, Dr. Unger holds membership in the British and American Iron and Steel Institutes, in the American Institute of Mining & Metallurgical Engineers, in the American Society for Testing Materials, the Engineers' Society of Western Pennsylvania, and the American Railway Engineering Association.

* * *

The new director of one of the finest scientific and technological museums in the United States, the Museum of the Franklin Institute, is a member and former chairman of the Philadelphia Chapter—HENRY BUTLER ALLEN, chief metallurgist for Henry Disston Co.

Mr. Allen attended Amherst College and received his degree of metallurgical engineer from Columbia University in 1911. For a short time he was United States Examiner of Iron and Steel for the Port of New York, and in 1913 assumed his present connection with Henry Disston Co. The new director has just returned from a six-weeks trip to Europe, where he visited many scientific museums and industrial plants. He has been chairman of the Museum Committee of the Institute for the past two years.

* * *

Two more A.S.M. members have joined the rapidly growing staff of Battelle Memorial Institute, Columbus, Ohio. They are ROBERT E. PARKINSON of the Chicago Chapter, formerly with Inland Steel Co., who has been assigned to the Division of Physical Metallurgy, and LLOYD R. JACKSON, formerly assistant research supervisor for Jones & Laughlin Steel Co. and member of the Pittsburgh Chapter, who is assigned to the Division of General Metallurgy at Battelle.

* * *

WM. H. H. GINDER, JR., Pittsburgh Chapter, has received a promotion and been transferred to the Ohio Works of the Carnegie Steel Co., Youngstown.

ARTHUR SCHAEFFER, district manager of the Republic Steel Corp. in Detroit and representative on the Corporation's sustaining membership in the Detroit Chapter of the Society, now heads up the enlarged organization there resulting from the acquisition of the Corrigan, McKinney Steel Co. and Newton Steel Co.

Mr. Schaeffer has been associated with the steel trade for 36 years, having joined Carnegie Steel Co. in 1899. He later became associated with the Central Alloy Steel Corp. which merged with Republic in 1930.

* * *

One of the Detroit Chapter's foundrymen, HAROLD S. AUSTIN, formerly metallurgist for Campbell, Wyant & Cannon Foundry Co., Muskegon, Mich., has been made foundry metallurgist at Buick Motor Co., Flint, Mich.

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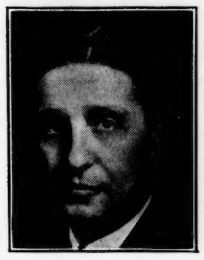

N. I. Stotz

After an association of 14 years with the Braeburn Alloy Steel Corp., NORMAN I. STOTZ, chairman of the Pittsburgh Chapter in 1933-34 and 1934-35, resigned as general superintendent to become affiliated with the Cyclops Steel Co., Titusville, Pa., in a metallurgical development capacity.

Stotz was educated at Colorado School of Mines and Lehigh University, and was first employed in the metallurgical department of Detroit Steel Products Co.

* * *

Another chapter chairman to make a change is FRED L. WEAVER of the Buffalo Chapter. He is now with the Great Lakes Foundry Sand Co., Detroit.

Fred received most of his metallurgical training under the direction of Dr. George B. Waterhouse, the well-known professor at Massachusetts Institute of Technology. He has worked for Pratt & Letchworth, Bethlehem, Republic, and Curtiss Aeroplane Co. Since 1922 he has been metallurgist and technical superintendent of the Bond Plant of American Radiator Co.

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And then we have E. J. P. ("ALPHABET") FISHER, chairman last year of the Peoria Chapter. He has recently resigned as metallurgist for Keystone Steel & Wire Co. to accept a similar position with Republic Steel Corp.

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Head man for the Tri-City Chapter, LESLIE S. FLETCHER, has been promoted from the rank of lieutenant to that of captain at the Rock Island Arsenal.

* * *

J. HALSEY MCKOWN, who has spent his entire business career with the Carnegie Steel Co., has been appointed assistant vice-president of the Carnegie-Illinois Steel Corp. Prior to this he had been manager of sales, in the bar, strip and semi-finished material division at Pittsburgh, where he is a member of the local A.S.M. chapter.

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The addition of HERSCHEL V. BEASLEY (Pittsburgh Chapter) to the technical staff of International Nickel Co. has been announced. Mr. Beasley will make his headquarters in the New York office. His activities will include problems involving the production and application of alloy cast irons.

During Mr. Beasley's metallurgical experience, he has held responsible positions in the Delco-Remy division of General Motors, the Estate Stove Co., and the Centre Foundry and Machine Co. In addition, he has carried on research into steel pouring practice at Mellon Institute of Industrial Research and was a Research Fellow at the United States Bureau of Mines where he was concerned with the physical chemistry of steel making.

VINCENT T. MALCOLM, director of research of Chapman Valve Mfg. Co., past chairman of the Springfield Chapter, A.S.M., plans to spend the greater part of November and December in England, France and Germany. Malcolm directed the development of the Chapmanizing process for the hardening of low carbon steels by the use of nitrogen.

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G. M. RIEGEL, junior member, has been transferred from the Peoria to the Canton-Massillon Chapter.

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JOSEPH W. VAN SCOTER, graduate of Rensselaer Polytechnic Institute, was metallurgist at Union Drawn Steel Co. before becoming metallurgist at Washburn Wire Co., Phillipsdale, R. I. He now attends the meetings of the Rhode Island Chapter.

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W. M. Black

The newly elected vice-president in charge of sales of the American Manganese Steel Co. entered the the employ of the company in 1912. WILLIAM M. BLACK at that time undertook a training course in the Chicago Heights foundry, which extended over several years. He then entered the Sales Department and before long was placed in charge of the Pittsburgh office.

In 1927 he became eastern sales manager at New York, and in 1934 was appointed general sales manager at Chicago Heights, where he still has his office as vice-president.

* * *

REID L. KENYON, supervising research engineer in charge of methods of physical testing and their development in the Research Laboratories of the American Rolling Mill Co., has recently been placed in charge of all metallurgical work in the manufacture and development of wrought steel wheels.

Mr. Kenyon is a newly elected trustee of the American Society for Metals, past chairman of the Cincinnati Chapter, and has contributed many technical papers to the Society's conventions and publications.

* * *

Another trustee, WALTHER MATHESIUS, has been made manager of operations for the Chicago district of the newly combined Carnegie-Illinois Steel Corp. Mr. Mathesius had just been made general superintendent of the South Works of the Illinois Steel Co., early in 1935.

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After graduation from Purdue University, EDWIN A. WALCHER, junior member of the Chicago Chapter, obtained a position as student apprentice with the Chain Belt Co. He has now transferred to the Milwaukee Chapter as a regular member.

* * *

R. S. DEAN, chief engineer, Metallurgical Division, U. S. Bureau of Mines, and member of the Washington Chapter, is on an extended trip through the United States, visiting the various sections of the Division. He will return to Washington about Dec. 1.

* * *

Assistant chief engineer of Hudson Motor Car Co. since 1929, H. M. NORTHRUP, past chairman of the Detroit Chapter, has been raised to the position of chief engineer. Mr. Northrup was graduated from Michigan College of Mining and Technology, and joined the Hudson staff in 1919. For many years he was in charge of a special department which, in addition to taking care of all physical, chemical, and metallurgical experimental work, also has charge of inspection of production materials and supervises the operation, heat treatment and similar technical processes in the production department.

Jerome Strauss

Prolific author of technical articles, many of them in the Society's *Transactions*, authority on stainless, tool, and other alloy steels, and vice-chairman of the Pittsburgh Chapter is JEROME STRAUSS, recently elected vice-president in charge of research and development at Vanadium Corp. of America, Bridgeville, Pa.

Mr. Strauss has been chief research engineer at the Vanadium Corp. since 1928. Prior to that he was materials engineer at the U. S. Naval Gun Factory. He was educated at Stevens Institute of Technology and has done metallurgical work in the Illinois Steel Co. and Western Drop Forge Co.

He is serving at present on the A.S.M. Recommended Practice Committee and was twice chairman of the Washington Chapter. He is active in the A.S.T.M., the American Foundrymen's Association, and the Alloys of Iron Research Committee of the Engineering Foundation.

* * *

DR. ALBERT SAUVEUR (Harvard's famed metallurgy professor and esteemed member of the A.S.M.) chairmanned the delegation representing the United States Government at the Seventh International Congress of Mining, Metallurgy, and Applied Geology held at Paris, Oct. 20 to 26.

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IRA S. LATIMER, who used to be with Follansbee Bros. Co., Follansbee, W. Va., and was a member of the Pittsburgh Chapter, is now metallurgist for Rotary Electric Steel Co., Detroit, and has transferred to the chapter in that city.

Deaths

It is with regret that the membership of the New Jersey Chapter reports the sudden death of Gilbert S. Waters, Monday evening, Oct. 14, while attending the Chapter meeting and lecture at the Essex House, Newark, N. J.

Mr. Waters was a charter member of the New Jersey Chapter and was a member of the present Executive Committee. He owned the Oiline Refining Co. of Newark which he organized 25 years ago.

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Joseph J. Driscoll was born in Auburn, N. Y., February 15, 1887. He died July 31, 1935.

Joe was metallurgist at Sanderson Works, Crucible Steel Co. of America, for many years. Previous to that, he was superintendent of the Melting Department. He was active in the affairs of the Syracuse Chapter and was chairman in 1928-29.

He was a man who was interested in the theoretical as well as the practical side of steel and metals, and gave much time to study. He also found great enjoyment in serious reading and knew the best in English literature. But mostly he was a lover of the outdoors. The Cedar Canoe, now in the boathouse up in Borodino on Skaneateles Lake, has carried him along the Finger Lakes adjacent to Auburn where he was familiar with every point and turn.

He loved the company of friends. He was never so happy as when bringing home a visitor to spend the night at Borodino, or when some of his associates would chance in to visit him.

The Syracuse Chapter sincerely regrets the loss of such a man.

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Members of the Los Angeles Chapter learned at the meeting on Sept. 24 of the passing of J. W. Cook, member since 1928.

U. S. Engineers Rushed by Russians, Build Steel Plants Under Difficulties

Reported by John W. McBean

Ontario Chapter, Oct. 11—The first meeting of the season was a joint session with the Hamilton branch of the Engineering Institute of Canada. A delightful talk was given by Arthur G. McKee of the A. G. McKee Co. of Cleveland. This firm specializes in the design and erection of blast furnaces and steel plants and had the contract for the plants and power development at Magnitogorsk in Russia.

Mr. McKee's talk combined some very interesting details of the engineering problems with an extremely lucid and humorous account of the human elements involved and an excellent picture of Russian conditions.

At the time of his first visit, his impression of Russia was of a land where everybody was hungry and nobody smiled, the people having too recently been subjected to depressing conditions. The Russians, however, are making a serious effort to overcome their handicaps and have done some wonderful things. In the theatrical line, for instance, Mr. McKee thought the Ballet of "A Midsummer Night's Dream" was the most gorgeous spectacle he had ever seen.

In spite of their lack of a sense of humor the Russians habitually say or do things that either amuse or aggravate others. Although incapable of speedy action themselves, they were constantly urging the American engineers to hurry. On one occasion the agent wanted the plans completed in two weeks when three had been promised. When it was pointed out that every drawing had a man working on it until late each night, the agent wanted two men on each drawing, or longer hours, or a day and a night draftsman for each drawing, and no amount of reasoning or explanation could persuade him of the folly of his suggestions. Finally he was asked how long a hen would take to hatch an egg and replied "three weeks." He was then asked if two hens could do it in two weeks. He considered this over-night and by next day the idea appeared to have penetrated and he agreed that three weeks would have to do.

Although unable to carry out the plans themselves, the Russians were constantly laying out programs and saying the engineers were behind schedule. On one occasion their agent was complaining because the engineers were behind. Mr. McKee turned the tables by reminding him he owed the engineers one sum of money which was over a month behind and another two weeks behind. "Oh," said the agent, "I don't want to talk about my behind; it's your behind I want to talk about."

The engineering and other problems were sometimes staggering. The only artery for all traffic is a single track railway across the length of the country with very few branches—in addition to the wheat and other merchandise, this must transport materials to and from the steel plants. The journey from Moscow to Magnitogorsk took four days, and all the coal had to travel 1500 miles by rail to the blast furnaces. The location of the steel plant was due to the opportunity for developing a large amount of power on the Ural River near the ore bodies.

The exuberant enthusiasm and imagination of the Russians was well illustrated in the astonishing statement of pig iron production from four blast furnaces; in spite of possible exaggeration in such reports, great progress has taken place in many directions, especially since 1933. Industry and agriculture have been better organized and placed in charge of more capable men.

Innovations in Bridge Building Speed Work And Increase Safety

Los Angeles Chapter, Sept. 24—Dr. Donald S. Clark, vice-chairman, presiding in the absence of Chairman C. E. Burt, announced a new method of presenting and answering technical questions to be inaugurated for the coming year.

The feature of the evening was an illustrated talk on the design and construction of the Oakland-San Francisco Bay Bridge by Captain Ralph Tudor, assistant to the designing engineer. Captain Tudor's talk was made most interesting by his discussion of how the final location of the bridge was decided upon by determining the centers of gravity of the inter - city commuters' destinations, some 50,000 daily, and by a survey of sub-surface ridges and elevations of foundation rock.

Many innovations in material handling, pier building, tower erection, and cable spinning, are being employed by the contractors, some resulting in speeding up operations to an extent heretofore unattained, and others providing increased safety for the workmen. The center anchorage pier of the west span is the largest ever built for a suspension bridge, and the bridge will be the largest in the world—8¼ miles long including approaches and ramps; it will have the world's third largest cantilever span, 1400 ft.

The cables for the bridge are made of 17,464 strands of 0.195-in. diameter galvanized wire, and will measure 28¾ in. in diameter when completed. The 0.85% carbon steel wire is subjected to several drawing operations in its manufacture, and develops the highest tensile strength yet attained in bridge wire—between 220,000 and 240,000 psi. The wire is not heat treated. The structural steel used in the superstructure and other parts of the bridge is a 0.20 carbon, high silicon steel.

An interesting booklet on this bridge, compiled by C. H. Purcell, chief engineer, and Earl Lee Kelly, state Director of Public Works, has been issued by the Columbia Steel Co., contractors for the steel and cable wire on this project, and complimentary copies may be obtained by addressing the general offices of Columbia Steel in San Francisco.

Damping Capacity Related To Overstress in Metals

Reported by A. W. Demmler

Pittsburgh Chapter, Oct. 10—Many a test specimen has had to fight for its laurels in rotating beam endurance limit testing. More recently, another factor in fatigue has been recognized, and G. R. Brophy, metallurgist, Research Laboratory, General Electric Co., gave the Chapter a very interesting presentation of this further hazard—damping capacity. To avoid becoming too critical, it may be considered as a function of internal friction, and with this allowed, the real problem then is the correlation of damping characteristics with the more common endurance properties.

Damping capacity appears to be related to the damage to a metal resulting from overstress and notches. However, these two factors rather oppose each other; high damping steels are resistant to sharp notches but sensitive to overstress, and the opposite holds true for low damping steels. Important factors in this problem seem to be grain size and structure.

Drawing Temperatures Affect Tool Hardness and Toughness

Reported by R. A. Thompson

Indianapolis Chapter, Oct. 21—The opening meeting of the year was held at the Washington Hotel, with O. V. Greene, metallurgist, Carpenter Steel Co., Reading, Pa., talking on the effect of various drawing temperatures on the hardness and toughness of tool steels.

The meeting brought a larger turnout than originally expected, but it was easy to place additional covers for the extra guests.

Four new applications were reported, and the entire Chapter is working hard to make a real gain in membership this season.

Age of Special Steels Here, Says Malcolm in Speech About Castings

Reported by Adolph O. Schaefer

Philadelphia Chapter, Oct. 25—The theme of the Philadelphia Chapter's program for the coming season is "keeping up to date with the latest trends and developments in the metals world."

This series was opened with an excellent talk on "Steel Castings" by Vincent T. Malcolm of the Chapman Valve Mfg. Co., Indian Orchard, Mass.

Those who heard the talk doubt if this subject has ever before been covered in such a comprehensive way. It is the speaker's belief that we are in an age of special steels, and that only special steels can meet the very special requirements imposed upon them by modern engineering design.

All of the factors entering into the selection and production of special castings were covered. The speaker mistrusts anyone who states positively that alloy so-and-so will solve a certain problem, but he believes profoundly that the practical men in the steel foundry business can help in any problem.

The importance of modern equipment was stressed and many heat treatments were outlined.

The writing of specifications has lagged far behind the demands of the engineering profession, but there have been developments in testing and inspection. There is an increasing use of radiographic methods. The Chapman Valve Mfg. Co. has cut up many castings for investigation, and learned much from them.

A long discussion followed this most interesting paper. Many questions were asked about castings, but several members took advantage of the opportunity to question the speaker about Chapmanizing.

The meeting was preceded by a dinner which was addressed by Henry B. Allen, former chairman of the Chapter, and new director of the Franklin Institute in Philadelphia. Mr. Allen's experiences in the steel mills of England and Sweden which he recently visited were liberally interspersed with experiences of other sorts including English cricket, Swedish punch, and Danish cigars. Thus the members were impressed by the great number of induction furnaces in Sheffield, by their use of Swedish muck bar, by Swedish use of charcoal in melting, and by the swimming arrangements in Oslo.

Inspection Trips Feature Meeting at Waynesboro

York Chapter—As is the usual custom, the October meeting was held at Waynesboro. It was a full day for those attending.

First there was a trip through the foundries of the Frick Co. and the Magnus Metal Co., followed by a tour of the Wayne Laboratories. John Shank, who operates the Laboratories and is a member of the Chapter, certainly made the visit worth while.

After the dinner, which was served at the Anthony Wayne Hotel, Chairman Frank J. Allen had a few remarks on the recent Metal Congress and the Annual Meeting of the Society. George J. O'Neill is back at his old stance on the Membership Committee and reported three new members.

Norman Gebbert then introduced the lecturer, C. M. Loeb of Climax Molybdenum Co., who was assisted by T. O. Parker. Mr. Loeb's most instructive talk was divided into two main heads—first the effect of molybdenum on physical properties of cast iron, and second its effect on foundry operation.

The efforts of the Waynesboro boys, Howard Horner, Jimmy Morrison, and Hutch Harbaugh, were certainly rewarded with a fine meeting.

The grand cooperation the Chapter always receives from the Waynesboro Manufacturers' Association and its energetic secretary, Mr. Knupp, must also be mentioned. As usual he was forward with his supply of Cumberland Valley apples to sustain the members on their homeward way.

Internal Structure Has Practical Side

Reported by E. W. Moore

Rochester Chapter, Oct. 14—At the first meeting of the 1935-36 season dinner was served at Todd Union, University of Rochester. The coffee talk was given by A. D. Heggie of the Rochester Chamber of Commerce, who explained the various activities carried on by the Chamber.

After dinner, members and friends adjourned to the Engineering Building to hear a lecture and demonstration on "Relation of the Internal Structure of Metals to Their Practical Performance," which was delivered by William J. Conley, professor of applied mechanics at the University of Rochester.

Professor Conley explained that his lecture would be divided into four groups. He then shot into action with all the vim, vigor and speed of a Billy Sunday. The manner in which he manipulated apparatus and covered the board with stress diagrams and charts seemed to indicate the advantages one has at home. The interesting and humorous way in which he performed his work was a tonic to our chapter, and probably explains why he is so popular with the engineering students at the University.

The professor demonstrated the two kinds of stress, tangential and normal, and the various combinations of these stresses. He thoroughly covered the subject of "deflection and modulus."

Under the second group he projected lantern slides and explained at length the structure, grain size, and space lattice as observed when metals are solidified by slow cooling.

Group 3 of his discourse was on equilibrium diagrams, under which he explained the constitution of various metals. He demonstrated fully the cross-sectional areas showing the conditions of the elements in their relation to rate of cooling.

His concluding remarks and lantern slides pertained to ferrite, cementite, pearlite, and hypo- and hyper-eutectoid structures. His demonstration of metallic expansion and contraction by means of heat units and dial indicators was mighty interesting.

Approximately 25 members from the Rochester Chapter attended the convention in Chicago. Four of them, L. J. Sullivan, John Reid, Frank McDonald, and H. J. LeClaire, gave their observations on such things as some of the exhibits, technical sessions, lecture courses, and general activities. (Those two "tragedians," Matthews and Morgan, were seen there, and according to our calculations, they paid $2.00 per hr. for their sleep.)

LECTURE COURSES

(Continued from page 1)

lurgy and Heat Treatment of Ferrous Materials."

Pittsburgh's course will run from November until March—12 lectures on the properties of metals, in which testing will be emphasized.

Philadelphia for the 15th year will cooperate with Temple University in the presentation of Horace C. Knerr's evening course on the "Heat Treatment and Metallography of Steel." A special evening course, the subject of which has not yet been announced, will also begin in January.

Los Angeles Chapter will have a course on "Practical Metallurgy for Engineers" under Dr. D. S. Clark of California Institute of Technology.

Tri-City's "Practical Course on Metallurgy" was opened Oct. 1 with 58 registered. Subjects are aluminum, case hardening, alloy steels, metallizing, wrought iron, testing materials, and tool steels.

Worcester's evening course at Worcester Polytechnic Institute will cover both class and laboratory work on properties, selection and treatment of metals and alloys.

Details of the Buffalo and Rochester Chapters' plans have not yet been received, although rumor credits Rochester with a four-year course.

Free Literature — Mail Coupon Below

Airless Cleaning

Comprehensive coverage of abrasive cleaning and preparation methods by description and illustration is contained in a colorful book published by the American Foundry Equipment Co. It describes the airless abrasive cleaning and preparation method known as "Wheelabrating." Bulletin Dx-112.

Solvent Degreasing

The effectiveness and simplicity of the new methods of solvent degreasing are remarkably well demonstrated in a booklet by Rex Products and Mfg. Co. Machines are available for the vapor, immersion, and spray methods—used either singly or in combination. Bulletin Dx-111.

High Speed Hardening Furnaces

P. D. M. high speed hardening furnaces are described in two bulletins by The Philadelphia Drying Machine Co.—one devoted to oil-fired and one to gas-fired furnaces, both made in single and twin chamber models. Details of construction, design features and tables of sizes and capacities are included. Bulletin R-152.

Kwikleen Gates

Dimensions and other pertinent information about W. S. Rockwell Co.'s Kwikleen type blast gates, which are designed to handle low pressure air and liquids carrying a large percentage of solids which ordinarily clog or jam the gates, are contained in Bulletin Nx-34.

Hardness Conversions

International Nickel Co. has a handy, celluloid, vest-pocket-size hardness conversion table, which quickly gives approximate relation between Brinell, Rockwell and Shore hardness values and corresponding strengths of nickel alloy steels. Bulletin Nx-45.

Castings for High Heat

The compositions, properties and uses of Driver-Harris Co.'s Nichrome, Chromax, and Cimet, and other alloys for high temperature and corrosion resistance are given in a new illustrated folder. Bulletin Nx-19.

Electronic Tube Control

A system of automatic temperature control based on electronic tube action eliminates mechanical appliances such as depressor bars, motors, cams, and springs, thereby dispensing with any mechanical work by the pointer of the galvanometer. This method is described by Thermo Control Devices, Inc. Bulletin Nx-110.

Centrifugal Castings

Centrifugal casting of stainless, heat and corrosion resisting alloys eliminates impurities and cooling strains and permits thinner and more uniform walls than any other method. This is explained in a bulletin by Michigan Steel Casting Co. Bulletin Nx-84.

Screw Machining

Screw machine products of aluminum are treated in authoritative and extensive manner in a booklet of Aluminum Co. of America. Besides general data on screw machining, a number of very useful tables appear. Bulletin Ar-54.

Metals Under Heat

Leitz Dilatometers for the thermal analysis of metal record photographically seven different curves showing the action of metals under heat. A most interesting pamphlet gives full details of this important metallurgical instrument. Bulletin M-47.

Pyrometer Drive Unit

For installations where their potentiometer control pyrometers are to be used singly, the Foxboro Co. has developed an improved type of motor drive unit. A new bulletin describes this unit and gives complete details regarding Foxboro potentiometer controllers. Bulletin Ox-21.

Air-Operated Controllers

The simplicity and outstanding performance of Brown Instrument Co.'s new Air-o-Line air-operated controllers, with their interchangeable control units and "ready-at-hand" adjustments, make them a revolutionary contribution to a large range of diversified industries. Bulletin Ox-3.

Forging Service

An illustrated folder shows a number of unusual equipments used in the shops of the Kropp Forge Co., including the acetylene torch pantograph, bar straightening equipments, etc. Bulletin Ox-77.

Metallographic Methods

"WACO Service" suggests application of the newer methods to daily routine. Included are the new bakelite specimen mount, low cost polishers and grinders, and an offer of sample Selvyt polishing cloth. Wilkens-Anderson Co. Bulletin Ox-7.

Laboratory Furnaces

Tiny induction furnaces which will melt ½ lb. of steel in 8 min. or 4 lb. of copper in 35 min. find a wide variety of uses in many kinds of laboratories. Ajax Electrothermic Corp. tells all about these small laboratory furnaces and the 3-kw. converter used with them in Bulletin Ox-41.

Steel Data Sheets

Wheelock, Lovejoy & Co. gives analyses, physical properties, heat treating instructions, and applications of Hy-Ten, Economo, and S.A.E. alloy steels in concise and easily usable form. Bulletin Ox-74.

Gear Steels

Those who have gear problems of any type can get valuable assistance from Endicott Forging & Mfg. Co., specialists in the manufacture of gear blanks. They carry in stock a large assortment of standard gear analyses and will manufacture to customer's blueprints and specifications. Bulletin Ox-65.

Forging Machines

The Acme Machinery Co. has just published an interesting bulletin on a distinctly new forging machine—the Model 35 Acme. This booklet illustrates and fully describes the new Acme Eccentric Header Slide which eliminates entirely the conventional Pitman construction. Bulletin Ox-39.

Swedish Tool Steels

"Pure-Ore" is a high carbon, high chromium Swedish steel especially valuable for dies in high production work. It is described in a folder by Kloster Steel Co., which is accompanied by a second folder describing "Swed-Oil," a non-shrinking, oil hardening tool steel which assures safety in hardening. Bulletin Ox-72.

Amsco Alloy

Amsco Alloy is the heat and corrosion resistant alloy made by American Manganese Steel Co. Its many uses, including application suggestions on each different analysis, are given in Bulletin Ox-9.

Tool Room Furnace

A new type of lining and one-valve control are two of the features of the American Gas Furnace Co.'s new tool room oven furnace that would make it economical to replace many older furnaces now in operation. Fully described in Bulletin Ox-11.

Electrotinning

E. I. du Pont de Nemours & Co.'s new manual on the sodium stannate-acetate electrotinning process is particularly timely. Electrodeposition, at first considered useful only for tin coating of recessed and irregularly shaped objects, by reason of recent improved and economical methods is now being considered favorably for all types of work. Bulletin Ox-29.

Double Strength Steel

A large fund of authentic information on Republic Steel Corp.'s new double strength steel is contained in an article by Howard L. Miller reprinted from *Metal Progress*. This steel promises wide application where a high tensile steel is required. Bulletin Ox-8.

Grain Size Measure

Classification of steels by grain size has become such an important laboratory procedure that Bausch & Lomb Optical Co., at the suggestion of Dr. Marcus A. Grossmann, has developed a grain size measuring eyepiece for microscopes which makes the determination a simple, routine matter. Described in Bulletin Ox-35.

Machine Steels

Because of the rapidly increasing use of rolled steel in machine construction Illinois Steel Co., in collaboration with Carnegie Steel Co., has prepared a handsome technical booklet on this subject. It is one of the most complete works ever offered to cover this new field. Bulletin Ox-1.

Refractory Mortars

How a good refractory mortar, properly fulfilling its functions of air-seal, cushion, and bond, will pay for itself in the extended service of furnace brickwork is told in Babcock & Wilcox's bulletin giving properties and recommendations for using various mortars and plastics. Bulletin Ox-75.

Optical Pyrometer

A simplified optical pyrometer which is compact, easy to operate, light, and entirely self-contained is invaluable in iron and steel manufacturing plants, heat treating, forging, rolling, and wire drawing plants. Such an instrument is marketed by Pyrometer Instrument Co. and is fully described in Bulletin Ox-37.

Industrial Thermometers

A striking new Industrial Thermometer Catalog has just been issued by C. J. Tagliabue Mfg. Co. It contains 24 pages of conveniently arranged listings of industrial thermometers, miscellaneous metal and woodback thermometers, hygrometers, U gages, mercurial vacuum gages and mercurial barometers. Bulletin Ox-62.

Electromet Review

A very attractive new house organ has recently made its appearance. It gives news and views of alloy steels and irons, but is mostly concerned with stainless steels. Electro Metallurgical Co. publishes it. Bulletin Ox-16.

Nickel-Copper Steels

Exceptional resistance to corrosion and abrasion increased tensile strength, and higher ductility are the qualities claimed for Youngstown Sheet & Tube Co.'s new series of Yoloy steels. A summary of properties and notes on their characteristics are contained in Bulletin Ox-93.

Vanadium Facts

Revived after nearly 20 years is the house organ of Vanadium Corp. of America, "Vanadium Facts." This paper shows considerable thought and care in its preparation and contains valuable and interesting information on vanadium steels. Bulletin Ox-27.

Machining Handbook

This little handbook giving machining properties and a great deal of other related data for a wide variety of steels should be of much value in aiding the steel user to select the right steel for the right purpose. Union Drawn Steel Co. Bulletin Ox-83.

Brass and Copper Shapes

A general classification of the diversified products made by the American Brass Co. comprises copper and copper alloyed with zinc, tin, nickel, lead, silicon and manganese in all combinations that can be wrought into sheets, wire, rods, tubes and special shapes. Bulletin Ox-89.

Rotoblast

A new blast cleaning machine eliminates the need for compressed air as the abrasive driving agent. Pangborn Corporation tells how a rapidly spinning wheel propels the abrasive by controlled centrifugal force. Bulletin Ox-68.

Long Time Creep Tests

Calorizing Co. offers a report presenting long time high temperature creep values on chromium-nickel alloys. This bulletin contains many pertinent data and recommendations as to safe working stresses for heat enduring castings at temperatures from 1400 to 2000° F. Bulletin Mr-26.

Fast-Cutting Steel

Bliss & Laughlin, Inc., offer an interesting technical folder on Ultra-Cut Steel, giving performance records of this high-speed screw stock on automatic screw machines. Physical data and microstructures are presented. Bulletin Ob-42.

Pyrometer Supplies

Claud S. Gordon Co. offers a large catalog giving prices and descriptions of the great variety of pyrometers and pyrometer accessories carried in stock for quick delivery. Bulletin Ob-53.

New Homo Furnace

The new Homo furnace described in a bulletin issued by Leeds & Northrup provides for even tempering on a very dense load. Automatic control includes a feature that prevents overshooting. Fine tempering on extra dense loads at low cost is provided. Bulletin Mx-46.

Forging Machines

National Machinery Co. has published a large and very attractive booklet which by excellent illustrations and well written text tells how forging machines are built and why they produce accurate forgings. Bulletin Ob-14.

New Way to Case Harden

Chapmanizing, the new method of surface hardening steel with nitrogen, is described in a very attractive booklet of Chapman Valve Mfg. Co. Information is given out on the method itself and on its metallurgical advantages. Bulletin Ob-80.

Titanium in Steel

The use of ferro carbon-titanium in steel is thoroughly described in a booklet of Titanium Alloy Mfg. Co. Titanium's application in forgings, castings, rails, sheets and plates is interestingly explained. Bulletin M-90.

Heat Resisting Alloy

Ohio Steel Foundry Co. offers an elaborate booklet covering the production of Fahrite heat resisting alloy castings, illustrating their many uses and giving comprehensive metallurgical data. Bulletin Ob-40.

The Prevention of Rust

"Proof of Results" is the apt title of a new booklet issued by Dearborn Chemical Co. Dozens of photographs, supported by an interesting text, show how No-Ox-Id keeps steel from rusting. Bulletin Mr-36.

Useful Wall Chart

Wyckoff Drawn Steel Co. offers a big new wall chart full of such useful data as comparative machinability of S.A.E. steels, tables for selecting steels according to machinability, cold forming properties, carburizing and hardening ability. Bulletin Ox-99.

Furnace Insulation

Johns-Manville offers to those who design or operate furnaces a new 72-page book describing insulation methods which improve performance and reduce operating costs. Requirements for each particular type of heating equipment are analyzed and detailed recommendations made accordingly. Bulletin Ox-100.

Spoilage Insurance

C. I. Hayes, Inc. has compiled a record of reports from over 300 users of their "Certain Curtain" controlled atmosphere furnaces showing how these furnaces have cut down spoilage in the heat treatment of tools and parts. Bulletin Sx-15.

Structural Welding

Reprints of an interesting article in *Journal* of the American Welding Society by A. F. Davis, covering welding of penstocks, a bubble tower, siphons, pipe lines, and an ocean pier, have been prepared by Lincoln Electric Co. Bulletin Sx-10.

Steel Specifications

A handy, up-to-date specification sheet for carbon and alloy steels is offered by Timken Steel & Tube Co. On one page are printed analyses of all important types of Timken steels. Bulletin Jy-71.

Welding Metallurgy

J. H. Critchett, vice-president of Union Carbide & Carbon Co., has prepared an exceptionally informative discussion of the physical and chemical principles involved in the oxy-acetylene welding of steel. Bulletin Ayx-63.

Conveyor Furnaces

Continuous chain belt conveyor furnaces handle miscellaneous parts without pans or trays — they are efficient, uniform, and flexible in operation. Improved furnaces of this type are described by Electric Furnace Co. Bulletin Ayx-30.

Maintenance by Welding

Industrial maintenance by Thermit welding is illustrated by actual applications to repair of street and railroad tracks, large machine parts, marine castings, crankshafts, and similar articles. Economy and permanence are featured. Metal & Thermit Co. Bulletin Ayx-64.

Carburizing Steel

High strength and ductility, forgeability, and machinability, combined with superior case carburizing properties, permit the attainment of maximum production with minimum cost. Such properties are obtainable in Jones & Laughlin's Jalcase steel. Bulletin Mx-50.

Kanthal Alloys

C. O. Jelliff Mfg. Co. offers a descriptive booklet on Kanthal alloys. Certain of these alloys may be used as resistance elements; others are for furnace parts or other heat resisting applications. Full details are given in Bulletin Je-78.

High Tensile Steels

Three types of high tensile steel particularly adapted to the transportation industries are described in a folder from U. S. Steel Corp. These are a chromium-copper-silicon steel for corrosion resistance, a medium manganese steel, and a strong structural silicon steel. Bulletin Mx-79.

Molybdenum in 1934

Climax Molybdenum Co. presents their annual book giving new developments in molybdenum, particularly as an alloy with iron and steel. The engineering data presented are made clear by many tables and illustrations. Bulletin Dc-4.

Polishing Machine

A reprint of an article from the A.S.M. *Transactions* by O. E. Romig and J. C. Whetzel is supplemented by photographs, specifications, and other information on the Cincinnati Electrical Tool Co.'s new metallographic polishing machine. Bulletin Ox-97.

Tool Steel Selector

A wall chart, 30 x 20 in., to be used as a means for selecting the proper type of tool steel is offered by Carpenter Steel Co. to tool steel users in the U.S.A. only. Bulletin Jzx-12.

Silico-Manganese Steel

Silico-Manganese steel for heavy duty springs is the subject of Bethlehem Steel Co.'s new folder giving its properties and recommendations for heat treatment. Bulletin Jyx-76.

The Review,
7016 Euclid Ave., Cleveland

Please have sent to me without charge or obligation the following literature described in the November issue. (Please order by number only.)

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Free Literature

Electric Furnaces

The electric furnaces made by Hoskins Mfg. Co. are well presented in their latest catalog. Contents include data on 17 types of furnaces and some valuable information on Chromel resistance wires and thermocouples. Bulletin Sp-24.

Metameter

Information on Bristol Co.'s Metameter, which makes it possible to control temperatures, pressures, levels, and other process conditions or operations at any distant place, is contained in Bulletin Ax-87.

Phosphor Bronze

An interesting little history of bronze from antiquity to the present prefaces a complete description of the properties, composition, uses, and shapes available of Seymour phosphor bronze in a folder by Seymour Mfg. Co. Bulletin Jyx-48.

Alloy Castings

A new bulletin on corrosion and heat resisting alloy castings is offered by Michiana Products Corp., manufacturers of Fire Armor and Zorite and other heat and acid resisting castings. Bulletin Jyx-81.

Burners and Valves

Auxiliary equipment for industrial furnaces that will insure proper heat production and correct combustion, such as oil and gas burners, blowers, regulating and shut-off valves, is fully described in Mahr Mfg. Co.'s illustrated booklet. Bulletin Jyx-5.

Die Steels

Darwin & Milner has two folders on their "Neor" non-deforming high carbon chromium steel and "Patent Cobaltchrome" steel for dies. Properties, applications, and detailed instructions for treatment are given. Bulletin Ox-91.

Heat Treating Manual

A folder of Chicago Flexible Shaft Co. contains conveniently arranged information on heat treating equipment for schools, laboratories and shops, and also illustrates the several types of Stewart industrial furnaces. Bulletin Ar-49.

Sheffield Steels

Wm. Jessop & Sons, Inc., have a leaflet which tells why a special anneal and a proper balancing of carbon, manganese and tungsten combine to make Sheffield Superior oil hardening steel non-distorting and easily machinable. Bulletin Jn-61.

Rockwell Tester

The Rockwell Superficial Hardness Tester is applicable to far thinner sheet and strip than the regular Rockwell. Its use for nitrided and case hardened parts is also described by Wilson Mechanical Instrument Co. in Bulletin Myx-22.

Neophot

"Neophot" is the name of a new metallograph of radically new design and universal adaptability. A pamphlet distributed by Carl Zeiss, Inc., gives its applications and features and is well illustrated with beautiful samples of micrographic work. Bulletin Jx-28.

Testing with Monotron

Shore Instrument & Mfg. Co. offers a new bulletin on Monotron hardness testing machines which function quickly and accurately under all conditions of practice. Bulletin Je-33.

Turbo-Compressors

The new items in Spencer Turbine Co.'s bulletin are a new and smaller "Midget" turbo for individual mounting, a single-stage line which effects new economies, and the gas-tight turbos for acid and explosive gases. Bulletin Mx-70.

Ni-Cr Castings

Compositions, properties, and uses of the high nickel-chromium castings made by The Electro Alloys Co. for heat, corrosion and abrasion resistance are concisely stated in a handy illustrated booklet. Bulletin Fx-32.

Radium Radiography

Advantages of portability, ease of application and manipulation in examination of castings, forgings, molds, weldings, and assemblies are attributed to radium for industrial radiography. Details are given in a booklet issued by Radon Co. Bulletin Jx-56.

Tempering Furnace

Technical details and operating data on Lindberg Steel Treating Co.'s new Cyclone electric tempering furnace which has shown a remarkable performance record in steel treating operations, are given in Bulletin Fx-66.

Big-End-Up

Gathmann Engineering Co. briefly explains the advantages of steel cast in big-end-up ingots, showing the freedom from pipe, excessive segregation and axial porosity. An 82% ingot-to-bloom yield of sound steel is usual. Bulletin Fe-13.

Heat Resisting Alloys

Authoritative information on alloy castings, especially the chromium-nickel and straight chromium alloys manufactured by General Alloys Co. to resist corrosion and high temperatures, is contained in Bulletin D-17.

Recuperators

Results obtained with Carborundum Company's recuperators using Carbofrax tubes are fuel savings, closer temperature control, faster heating, and improved furnace atmosphere. Complete engineering data regarding application to various types of furnaces are given in Bulletin Fx-57.

Centrifugal Compressors

B. F. Sturtevant Co. has a line of centrifugal compressors designed particularly for industrial furnace applications. These are illustrated and described in Bulletin Myx-58.

Compounds and Lubricants

J. W. Kelley Co.'s line of Beacon Brand products—industrial oils, carburizing compounds, heat treating salts, greases, and cleaners—is described in a little booklet which also tells about the company's experience, equipment, and facilities for quick service. Bulletin Ox-102.

Mo-W High Speed Steel

In a four-page folder, The Cleveland Twist Drill Co. announces the development of a new steel for high speed metal-cutting tools. Mo-Max steels are particularly suited to tools subjected to severe conditions of heat and abrasion. Physical characteristics and heat treating temperatures are discussed. Bulletin Ox-103.

Casting Problems

Unusual casting problems that were solved by the use of National Alloy Steel Co.'s oxidation, corrosion, and abrasion resisting castings are shown in a clever pictorial manner in an attractive folder. Bulletin Ox-104.

DX Units

Surface Combustion Corp.'s DX unit is a machine for producing an inexpensive gas for controlled atmospheres in industrial heating processes. Its operation and applications are covered in Bulletin Ox-51.

Blast Nozzles

The advantages of Norbide for pressure blast nozzle liners are described in Norton Co.'s folder. It also gives prices, hose and gasket sizes and fittings and adaptor numbers and dimensions for special types. Bulletin Ox-88.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912,

Of THE REVIEW of the American Society for Metals, Published bi-monthly at Cleveland, Ohio, for October 1, 1935, State of Ohio, County of Cuyahoga, ss. Before me, a notary public, in and for the state and county aforesaid, personally appeared Ray T. Bayless, who, having been duly sworn according to law, deposes and says that he is the editor of THE REVIEW of the American Society for Metals, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations to wit:

1.—That the names and addresses of the publisher, editor, managing editor, and the business managers are: Publisher, American Society for Metals, 7016 Euclid Ave., Cleveland, Ohio; Editor, Ray T. Bayless, 7016 Euclid Ave., Cleveland, Ohio; Managing Editor, M. R. Hyslop, 7016 Euclid Ave., Cleveland, Ohio; Business Manager, W. H. Eisenman, 7016 Euclid Ave., Cleveland, Ohio.

2.—That the owner is: The American Society for Metals, 7016 Euclid Avenue, Cleveland, Ohio, which is an educational institution, the officers being: President, B. F. Shepherd; Vice-President, R. S. Archer; Secretary, W. H. Eisenman; Treasurer, Emil Gathmann; Trustees, E. C. Bain, W. P. Woodside, G. B. Waterhouse, Walter Mathesius, and W. H. Phillips. All above officers of the American Society for Metals, address at 7016 Euclid Avenue, Cleveland, O.

3.—That known bondholders, mortgagees and other security holders are: none.

4.—That the two paragraphs next above, giving the names of the owners, stockholders and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him. Ray T. Bayless, editor, sworn to and subscribed before me this 11th day of October, 1935.

(Seal) Arthur T. Wehrle, notary public. (My commission expires January, 1938.)

Philadelphia Has Record Meeting; Over 600 Attend

Reported by A. O. Schaefer

Philadelphia Chapter, Sept. 26—By tradition, Philadelphia holds its first meeting of the season at Temple University to stimulate interest in the Evening Course in Metallurgy and Heat Treatment which it sponsors there. But it is distinctly not according to tradition to smash all previous records for attendance with over 600 members and guests packed in the auditorium.

The subject discussed by Prof. H. F. Moore (University of Illinois) was "The Application of Metals in Industry." It was an interesting study of metals as materials of construction. It is characteristic of Professor Moore that his remarks stimulate interest and create a desire for further knowledge.

He considers it a hopeful sign that, with all our control of the quality of metals, we have not yet reached the ideal. If metallurgy were a finished science, there would be no fun in it. There is plenty of need for experimentation, and in many places of his talk he used the words "we don't know."

From the historical side, Professor Moore recommended reading Louis Monkford's "Technics and Civilization." He places in order of importance the qualities we desire most in a metal as strength, stiffness, ductility, and permanence.

An interesting study of stress-strain diagrams told much of the properties of various metals. Studies of various failures told more. Professor Moore found that 80% of a large number of failures observed were caused by sharp corners. He stated it as the eleventh commandment for engineers: "In all shafts, and highly stressed parts, thou shalt not have sharp corners of any sort."

An interesting feature of the meeting was an exhibit of progress in metals, toward which 28 Philadelphia companies contributed. A miniature tube drawing bench was in operation, sections of stream-lined trains were shown, the heat treatment of airplane wing beams was demonstrated, and many other displays testified to metal progress in Philadelphia.

The record-breaking dinner attendance of 140 listened to a stirring talk on sportsmanship by Dr. E. Leroy Mercer, Dean of the Department of Physical Education of the University of Pennsylvania. Dr. Mercer, as a former all-American player, and a successful football coach, firmly believes in the value of the lessons to be learned on the gridiron. His description of a football coach's job as the most precarious in the world aroused much interest.

Little but superlatives can be heaped upon a meeting that by most standards was the greatest in the Chapter's history. Certainly such a first meeting suggests that the whole year will probably be Philadelphia's greatest.

Use of Research Tools Is Important in Metallurgy

Reported by B. L. McCarthy

Buffalo Chapter, Sept. 12—About 50 members heard Dr. A. B. Kinzel, Union Carbide & Carbon Co., speak on "The Application of Research Tools."

The use of research tools has been an important factor in the development of metallurgy from an art to a science. The laws of physics and chemistry have been a contributing factor in this development. The two requisites of a research tool are precision and sensitivity—they must be able to produce results accurately and duplicate results within a small range.

Dr. Kinzel briefly discussed the principles of tension testing, wear, bend, electrical resistance, magnetic testing, fatigue testing, and the use of the spectroscope and X-ray. He also demonstrated a method of testing welds by striking with a hammer and studying the tone with a stethoscope.

In the application of research tools, said Kinzel, fundamental knowledge of the principles of the test to be made will enable the metallurgist to use the right tool or construct his own research tool for the particular problem at hand.

Carburizing Again Holds Interest at N. J. Meeting

Reported by Elton W. Jenkins

New Jersey Chapter, Oct. 14—The second meeting of the season found 85 members at the dinner and well over 200 attending the lecture. The speaker was John F. Wyzalek of Hyatt Bearing Division, General Motors Co., Harrison.

Mr. Wyzalek is a local metallurgist who has been connected with the American Society for Metals for a number of years and is a past chairman of the New Jersey Chapter. At present he is a member of the Advisory Board.

The lecture was a continuation of one given last year on the same subject, and covered the methods, equipment, and materials used for carburizing steels. The interest of the subject was evidenced by the discussion, which continued for approximately an hour, while many interesting features were explained in detail.

Principles of

HEAT TREATMENT

By **Dr. Marcus A. Grossmann**

Director of Research

Carnegie-Illinois Steel Corp., Chicago

Dr. Grossmann's intensive educational course presented at the Chicago Convention of the Society in October, 1935, as a series of five lectures is now made available to the entire membership in book form. It is a simple and straight-forward explanation of the fundamental laws and current practice of heat treating steel. Since information of this nature is not easily available and is scattered through the technical press, a complete correlation and survey of the existing data on the heat treatment of steel by an authority is most timely.

147 pages; 102 illustrations

Price: $2.50 cloth bound; $2.00 paper bound

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Wider Field for Low Alloy Steels

Chicago Chapter, Sept. 12—Recent developments in the use of low alloy steels, which in their potential market as well as their cost compare with stainless and other high alloy steels much as the Missouri mule compares with the racing thoroughbred, were described by George N. Schramm, development engineer, American Sheet and Tin Plate Co., Pittsburgh.

The meeting was the first of the season with an attendance in the neighborhood of 500. National Secretary Bill Eisenman was on hand to tell the members about the National Metal Exposition opening in Chicago, Sept. 30.

By definition Mr. Schramm restricted the steels he discussed to a maximum of 2% alloying elements, these being principally chromium, silicon, manganese, copper and nickel. Metallurgists have also found, he reported, that phosphorus not exceeding 0.20% is a useful instead of a harmful constituent in some of these steels.

Mr. Schramm devoted his discussion of recent applications of low alloy steels principally to the railroad field, and more particularly to the manner in which their greater strength and durability, over ordinary mild steels (with some increased corrosion resistance, although not as much as is found in the stainless steels) is winning them increasing acceptance in the construction of freight cars.

In the "raw" state, where the price spread is greatest, low alloy steels cost approximately twice as much as plain carbon steels. Addition of treatment costs necessary to fabricating reduces the price ratio, for equal weights, to about seven to five, however, and when the lesser weight of alloy steel necessary for the same job is taken into consideration, its proponents are prepared to argue that the finished freight car can be produced at no increase in cost.

The resulting saving in weight with the use of such steels is regarded as a powerful aid to the railroads in increasing operating revenues through reducing deadweight and increasing payload in their freight trains. A low alloy steel hopper coal car weighs 30,000 lb. as against 42,000 to 45,000 lb. for the older type car, and carries 69 tons as against 62 tons of coal, an increase in payload capacity of more than 10% without any increase in total weight.

Mr. Schramm made it plain that while the greatest potentialities of low alloy steels in the railroad field lie in freight cars, where cost is a vital item, the more spectacular lightweight passenger trains have not been entirely abandoned to stainless steel and other light alloys. The Alton, Illinois Central, and Gulf, Mobile and Northern railroads are among those running or building high speed passenger trains of low alloy steels, and they are also finding wide use in street cars, trackless trolley buses and truck bodies.

Employment Service

Address answers care of A. S. M., 7016 Euclid Ave., Cleveland, unless otherwise stated

RESEARCH WORKER: Ten years' experience solving metallurgical problems concerning magnetic materials, high purity metals and alloys, gases in metals, vacuum processes, etc. Has done teaching and consulting work. Box 11-5.

SALES REPRESENTATIVE: Desires position in progressive concern where experience in sales, sales promotion and advertising work with an engineering background would fit in to advantage. Box 11-10.

METALLURGIST - CHEMIST: University graduate, 20 years' experience ferrous and non-ferrous metals. Heat treatment, chemical analysis, physical testing and metal finishing. Machinery, automotive and hardware industries. A-1 references. Moderate salary. Box 11-15.

SALESMAN: Alloy and stainless steels. University of Pennsylvania graduate in chemical engineering. Broad metallurgical experience with proven sales ability. Direct contact with chief engineers, plant superintendents and purchasing agents in eastern states. Box 11-20.

METALLURGIST whose present duties are quite varied desires to concentrate in field of iron or steel. Can also qualify as chemist in iron or steel industry. 8½ years' experience. Box 11-25.

TECHNICAL GRADUATE: 24, degree of B. S. in metallurgy. At present employed in physical testing department of alloy steel company. Desires opening in company making alloy steel, offering practical mill experience. Box 11-30.

TOOL STEEL SALESMAN: 15 years' experience. Understands practical heat treatment of tool steels. Splendid following in New York State, Connecticut and New Jersey, but will travel anywhere. Box 11-35.

YOUNG MAN: College graduate, with major in physics, including optics, desires opportunity in testing or research laboratory. Salary not important. Box 11-40.

Positions Open

GOVERNMENT POSITIONS: Associate and assistant metallurgists (recovery and physical). Applications for Civil Service examinations must be on file with the U. S. Civil Service Commission, Washington, D. C., not later than Dec. 9, 1935. Full information may be obtained from the Secretary of the Civil Service Board of Examiners at the post office or custom house in any city or from the Civil Service Commission in Washington.

TOOL STEEL SALESMAN: Experienced man 35 to 40 years old, preferably with metallurgical background, familiar with Wisconsin territory. Write fully regarding past connections and knowledge of Wisconsin territory. Excellent opportunity for high grade tool steel salesman. Box 11-45.

Describes Beryllium Alloys

Reported by Walter C. Troy

Notre Dame Group, Oct. 24—At the first meeting of the season, Frederic H. Craven of Bendix Products Corp., gave an interesting account of his graduate work in beryllium-copper alloys, including a brief premise on occurrence, extraction and history of beryllium.

The talk was illustrated with slides including equilibrium and heat treating diagrams and photomicrographs.

Large Castings Need Special Equipment to Heat Treat Properly

Reported by J. T. Howat

Pittsburgh Chapter, Sept. 12—About 70 members attended the dinner and when the meeting was started fully 150 were present. From the reports of the various committee chairmen, the Pittsburgh Chapter can look forward to a very enjoyable and beneficial year.

Chairman A. D. Beeken turned the meeting over to Jerome Strauss, who introduced our old reliable friend, Bill Merten. Bill has been long associated with the heat treatment of large steel castings and spoke very capably on that subject.

Dendritic segregation is by no means the sole cause of defective steel and a pronounced dendritic structure is not a sufficient reason for rejection. When the dendritic segregation is composed of elements manifested by continuous segregation of non-metallic impurities, then that steel as a rule will be found defective. This condition cannot be remedied by heat treatment and must be prevented by suitable control of solidification.

The heat treatment necessary to modify the grain structure of large castings requires special equipment. Castings of 40 to 60 in. cross-section, weighing from 100,000 to 300,000 lb., require temperatures of 1950 to 2100° F., with soaking at 2000° F. for at least 50 to 60 hr. This is a preliminary homogenizing treatment and is necessary before further heat treatment.

Since coupon tests indicate the potential values which can be obtained from cast steel, it is essential that the castings give these values throughout and that is the purpose of this treatment.

Such heat treatment requires special lined furnaces to withstand the long heating period at the high temperature, and a long, luminous flame obtained by special burners provides a very effective furnace condition.

A point brought out in the discussion was that a controlling feature of the structure of a large casting is the finishing condition of the open-hearth heat, and the steps taken to insure proper solidification. It was agreed that the size of the impurities is a deciding factor in the possibility of successfully redistributing them by this treatment. The finer the impurities and the smaller the amount of segregation, the less need we have for high temperature treatments.

New Temperature Control Is Operated by Vacuum Tube

A new method of automatic temperature control known as the Wheelco system operates electrically by means of a vacuum tube. Mechanical parts are thus eliminated, and the pointer of the galvanometer has no mechanical work to overcome. It is distributed by Thermo Control Devices, Chicago, Ill.

Extensive Researches to Develop 'Phone Materials

Reported by J. F. Calef

Chicago Chapter, Oct. 10—J. R. Townsend of the Bell Telephone Laboratories gave an excellent review of properties of metals used in telephone equipment. This review showed the extensive researches necessary to determine the qualities of the materials which are necessary for long life in telephone usage.

Die castings were selected through the collaboration of the die casting committee of the American Society for Testing Materials. Mr. Townsend outlined here the detailed and elaborate work which had been done by this committee to determine the effects of corroding influences in various temperature and tropical zones, and indoor and outdoor exposures.

He also emphasized the work necessary to determine physical characteristics necessary for various non-ferrous materials used for springs in the telephone. Here again, both the Bell Telephone Laboratories and the A.S.T.M. committee did considerable work and produced specifications which are proving of vast benefit to the telephone industry.

A considerable portion of the evening was devoted to magnetic materials, such as commercially pure iron, high nickel iron, and various other alloys which were developed especially for the magnetic requirements of the telephone. It was interesting to note the systematic development work of the various alloys for specific purposes and then their extension to many other parts of telephone equipment.

Considering the large number of manufacturers of electrical equipment in the Chicago area, this meeting covered a very important topic and was well attended.

Care Needed in Macro Etch Test Interpretation

Reported by F. H. Clark

New York Chapter, Oct. 21—S. C. Spalding, metallurgist for the American Brass Co., and new trustee of the A.S.M., gave a very interesting talk on "Tool Steels" before the chapter meeting, held at the Pennsylvania Hotel.

An outline was given of the methods of inspection used by the American Brass Co. in its purchases of tool steel. Care must be taken in interpreting the macro etch, and Mr. Spalding demonstrated with slides how the surface of bars of steel treated by macro etching could be misleading. Hardenability tests are used extensively and are considered of greater value than macro etching.

In the discussion which followed, Sam Tour inquired what temperature is best for tempering for relief of stress only and received the reply of 325 to 350° F. for at least an hour for small parts.

L. Bergen of the Crucible Steel Co. observed that studies on hardenability and grain size have improved plain carbon tool steels to such an extent that demand for them has greatly increased.

3 Testing Talks Cover Bellows, Sheet, Fatigue

Reported by Richard R. Kennedy

Dayton Chapter, Sept. 10—The first Fall meeting was a smoker for members. Three short papers were presented.

George Long of the Frigidaire Corp. talked on "Bellows Testing." He sketched the methods used in manufacturing metallic bellows and described some of their uses. Some interesting test methods have been devised to determine the characteristics of bellows. The rate of the bellows (the load required to compress them a given amount) is determined. A study of the microstructure is often an aid in determining the cause of failure. An ingenious fatigue test has been developed in which compressed air is alternately admitted to and exhausted from the bellows. Changes in material have been made as a result of these tests which have greatly improved the quality of the bellows. At present Mr. Long and his associates are working on X-ray diffraction tests by which they expect to improve the product further.

The second speaker was Reid L. Kenyon of the American Rolling Mill Co., who talked on "Special Methods of Testing as Applied to Deep Drawing Sheets." He traced the development of the tension test for sheet and described the equipment now in use. On hydraulic tensile machines the range may be changed to suit the work. This is important since the yield strength and ultimate strength of the steel may be determined with great precision if the range used for the test is only a little greater than the maximum load required to fracture the specimen.

Mr. Kenyon described the automatic extensometer which he has developed for testing thin sheet steel. He showed a number of curves drawn by this device illustrating the effect of annealing, cold work and aging.

The last speaker was Ture T. Oberg of Wright Field, who spoke on "Fatigue Characteristics of Metals." Mr. Oberg defined fatigue as failure of a metal under repeated stress due to the growth of one or more small cracks which form at some point of localized high stress. He described the method of making fatigue tests on the rotating beam and torsional shear machines and discussed results obtained.

When heating ductile steels it is necessary to continue the fatigue test for 10,000,000 to 25,000,000 reversals of stress in order to determine the endurance limit. With hard steels the tests must be continued to 50,000,000 reversals while with aluminum or magnesium alloys the tests should be run for 500,000,000 reversals. Mr. Oberg had specimens which failed in fatigue and cited the results of his work on steel and aluminum alloys.

The speakers conducted informal discussions at the conclusion of the meeting. Large quantities of sandwiches and coffee provided by our efficient secretary, Fred Reiter, were consumed in the course of the discussions.

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